

SECTION 15075

MECHANICAL IDENTIFICATION

LANL MASTER CONSTRUCTION SPECIFICATION

Pipe markers in this specification comply with the LIR 402-100-01, LANL Sign, Label and Tag Catalog (Piping Section). Refer to this catalog for additional pipe makers.

When editing to suit project, author shall add job-specific requirements and delete only those portions that in no way apply to the activity (e.g., a component that does not apply). To seek a variance from applicable requirements, contact the Engineering Standards Manual (ESM) Mechanical POC.

When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General Requirements.

Delete information within "stars" during editing

Specification developed for ML-3 / ML-4 projects. For ML-1 / ML-2, additional requirements and QA reviews are required.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Valve Tags.
- B. Pipe Markers/Arrow Tape Above Ground.
- C. Underground Piping Warning Tape.
- D. Ceiling Tacks.
- E. Duct Markers.
- F. Mechanical Equipment and HVAC Controls Identification.
- G. Safety Signs.
- H. Fire Hydrants and Isolation Valves Numbering.

1.2 LANL PERFORMED WORK

- A. LANL's Support Services Subcontractor will identify hydrants and hydrant isolation valves. Refer to PART 3.

- B. [Permanent labeling for mechanical equipment and HVAC controls will be furnished and installed by LANL.]

1.3 DEFINITIONS

- A. Exposed Areas: Finished areas and other areas used by personnel in normal use of building, such as equipment rooms and storage rooms.
- B. Concealed Areas: Duct or pipe tunnels, duct or pipe chases, spaces above accessible ceilings, and crawl spaces.

1.4 SUBMITTALS

- A. Submit the following in accordance with Section 01330, Submittal Procedures:
 - 1. Catalog data.
 - 2. Installation instructions.

PART 2 PRODUCTS

2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Comply with Section 01630, Product Options and Substitutions.

2.2 MANUFACTURER

- A. W. H. Brady Co. catalog numbers are used as a basis of identification.
- B. Stock catalog numbers are listed in PART 2 and PART 3 schedules. Contractor is responsible to review schedules and provide required markers. In some instances, "non-stock" markers (special) may be required.

2.3 VALVE TAGS

- A. Metal Tags: No. 23211, brass with stamped letters; tag sizes minimum 2 1/2 inches diameter with smooth edges.
- B. Beaded Chain: No. 23306, size 6 brass 4 1/2 inches long with locking link.

2.4 PIPE MARKERS/ARROW TAPE ABOVE GROUND

- A. Color: Conform to ANSI A13.1.
- B. Self-Sticking Pipe Markers/Arrow Tape: Material B-946, flexible, vinyl film tape with pressure sensitive permanent adhesive backing and printed markings.
 - 1. Suitable for indoor/outdoor application.

2. Temperature range: Minus 40 degrees to 180 degrees F.

2.5 UNDERGROUND PIPING WARNING TAPE

- A. Comply with Section 02310, Grading, Excavating, and Trenching.

2.6 CEILING TACKS

- A. No. 23250 series, steel with 7/8-inch diameter color-coded head.
- B. Color code as follows:
 1. Yellow HVAC Equipment
 2. Red Fire Dampers / Smoke Dampers
 3. Green Plumbing Valves, Trap-Priming Devices, etc.
 4. Blue Heating / Cooling Valves

2.7 DUCT MARKERS

- A. Plastic Tape Duct Marker and Arrows: Material No. B-946, flexible vinyl film tapes with pressure sensitive permanent adhesive backing and printed markings.
 1. Suitable for indoor/outdoor application.
 2. Temperature range: Minus 40 degrees to 180 degrees F.
- B. Letter style block, 2 inches height minimum.

2.8 MECHANICAL EQUIPMENT AND HVAC CONTROLS IDENTIFICATION

Consult with the FMU facility engineer to determine labeling requirements (numbering scheme, bar code, labels, Contractor or LANL furnished and installed labeling, etc.) and edit this section as required.

- A. Identify mechanical equipment and HVAC controls, e.g., air handling units, pumps, heat transfer equipment, water treatment devices, controls instruments, stationary tanks/containers, and similar items, with nameplates or tags.

Provide the following unless otherwise directed by the FMU facility engineer.

1. Provide nameplates made of durable non-corrosive, non-conductive, and impact resistant plastic material with standard overlamine (use UV resistant overlamine for outdoors) on one side.
 - a. Size: [1-1/2 x 3 inch] or [2-1/2 or 4 inch].
 - b. Color: [].
 - c. Manufacturer: Brady No. B418.
 2. Provide lettering as follows:
 - a. Size: 10 point minimum (larger preferred).
 - b. Spacing: 1/4 inch from top, 1/8 inch from bottom, 1/16 inch between lines.
 3. Provide nameplate with component nomenclature as noted in the Contract Documents.
 - a. As a minimum, identify the system, e.g., HVAC (heating, ventilating, and air conditioning), the component, e.g., FGF (furnace, gas fired), and the sequence number.
 - b. Refer to the ESM, Chapter 1, Section 230, for component nomenclature for new and major modifications to facilities.
- B. Stationary Tanks/Containers of Hazardous Materials: Identify the hazardous material and label to comply with NFPA 704, Standard System for the Identification of Hazards of Materials for Emergency Response.
1. Name of Hazardous Material: Provide 2 inch high minimum lettering. Use same material as pipe identification markers, yellow background with black letters.
 2. Hazardous Material Signal and Characters: Provide 2 inch high minimum characters and a 5 inch square (overall size) diamond shaped material signal made of outdoor grade pressure sensitive vinyl. Refer to the Material Safety Data Sheet (MSDS) for the hazardous material for numbers, letters, or symbols to be used within the NFPA 704 hazardous material signal. Material signal: Brady catalog number 58501. Characters: Brady catalog numbers [].
- C. Labeling shall be furnished and installed by the Contractor.

*****[OR] *****

- D. The Contractor shall provide temporary labeling. Permanent labeling will be furnished and installed by LANL.

2.9 SAFETY SIGNS

- A. Colors associated with specific words such as "Danger," "Warning," "Caution," or "Notice" shall conform to ANSI Z35.1.
- B. Provide signage identifying each fixture, including fume hood cup sinks, being served by non-potable water.

PART 3 EXECUTION

3.1 FIRE HYDRANTS

- A. LANL's Support Services Subcontractor will number fire hydrants and the hydrant isolation valves (valve box lids).

3.2 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.

3.3 INSTALLATION

- A. Valve Tags:
 - 1. Install with brass beaded chain.
 - 2. Steel stamp or engrave valve tag in accordance with schedule herein.
 - 3. Letter style block, 1/4-inch height minimum.
 - 4. Tag all valves in concealed or exposed areas except isolation and by-pass valves installed adjacent to the equipment they serve.
 - 5. Provide typewritten letter size list of applied tags and location. [Frame under glass and hang where directed].
- B. Pipe Markers Above Ground:
 - 1. Install in accordance with manufacturer's instructions.
 - 2. Seal markers with clear lacquer.

3. Identify piping in exposed or concealed areas in accordance with schedule herein.
4. Pipe marker consists of pipe contents identification with flow direction arrow tape. Provide consistent color scheme, unless otherwise noted.
5. Wrap arrow tape completely around pipe at both ends of pipe markers.
6. Install in clear view and align with axis of piping.
7. Label piping at intervals of not more than 20 feet on horizontal and vertical runs, at each branch connection, and where pipe penetrates walls, ceilings and floors (both sides).
8. Label waste piping below laboratory sinks to indicate destination.
9. Size of label depends on outside diameter (OD) of pipe. Pipe OD includes insulation or protective coating.
10. Minimum length of marker including arrows:

<u>Outside Diameter</u>	<u>Length (inches)</u>
2 inches or smaller	8
Greater than 2 inches to less than 8 inches	12
8 inches to 10 inches	24
Over 10 inches	32

- C. Ceiling Tacks: Provide ceiling tacks to locate HVAC equipment, valves or dampers above accessible suspended ceilings. Locate tacks in corner of panel closest to equipment.
- D. Duct Markers:
 1. Install in accordance with manufacturer's instructions.
 2. Seal markers with clear lacquer.
 3. Identify ducts in exposed or concealed areas in accordance with the schedule.
 4. Duct markers consist of duct identification name with flow direction arrows. Provide consistent color scheme.

5. Install in clear view and align with axis of duct.
6. Label ducts at intervals of not more than 20 feet on horizontal and vertical runs, at each branch connection, and where duct penetrates walls, ceilings and floors (both sides).

E. Safety Signs: Install in clear view.

3.4 SCHEDULES

A. Pipe Markers and Valve Tag Legend:

		Outside Diameter (Letter Height)				
Pipe Identification	Background Color/ Letter Color	6" or greater (3 1/2" high) Style 1HV*	3" to less than 6" (2" high) Style 1*	1" to less than 3" (3/4" high) Style 4*	Less than 1" (5/16" high) Style 3C*	Valve Tag Legend
		Pipe Marker Catalog Numbers				
Acetylene Gas	Yel/Blk	7001				AC
Argon	Grn/Wht	7015				AR
Breathing Air	Grn/Wht	7035				BA
Chemical/Supply	Yel/Blk	7042/7311				CS
Chilled Water Return	Grn/Wht	7046				CWR
Chilled Water Supply	Grn/Wht	7047				CWS
Compressed Air	Yel/Blk	7058				CA
Condensate Pump Discharge	Yel/Blk	7064				CONPMP
Deionized Water/Drain	Grn/Wht	7073/7090				DIWD
Deionized Water Return	Grn/Wht	7074				DIWR
Deionized Water Supply	Grn/Wht	7075				DIWS
Drain	Grn/Wht	7090				D
Drain	Yel/Blk	7091				D
Fire Protection Water	Red/Wh t	7110				F
Fuel Oil Return	Yel/Blk	7116				FOR
Fuel Oil Supply	Yel/Blk	7117				FOS
Fuel Oil Vent	Yel/Blk	7118				FOV
Electric Traced	Yel/Blk	7096				-----
Heating Water Return	Yell/Blk	7129				HWR
Heating Water Supply	Yel/Blk	7130				HWS
Helium	Grn/Wht	7132				HE
High Pressure Condensate (Above 15 PSIG)	Yel/Blk	7137				CONHP
High Pressure Natural Gas (Above 5 PSIG)	Yel/Blk	7139				NG

		Outside Diameter (Letter Height)				
Pipe Identification	Background Color/ Letter Color	6" or greater (3 1/2" high) Style 1HV*	3" to less than 6" (2" high) Style 1*	1" to less than 3" (3/4" high) Style 4*	Less than 1" (5/16" high) Style 3C*	Valve Tag Legend
		Pipe Marker Catalog Numbers				
High Pressure Steam (Above 15 PSIG)	Yel/Blk	7141				STMHP
Hydrogen	Yel/Blk	7157				H2
Instrument Air	Blu/Wht	7168				IA
Liquid Nitrogen	Yel/Blk	7172				LN
Low Pressure Condensate (15 PSIG or less)	Yel/Blk	7175				CONLP
Low Pressure Natural Gas (Less than 14" W.C.)	Yel/Blk	7177				NGL
Low Pressure Steam (15 PSIG or less)	Yel/Blk	7179				STMLP
Medium Pressure Natural Gas (14" W.C. to 5 PSIG)	Yel/Blk	7190				NGM
Nitrogen	Grn/Wht	7198				N2
Non-Potable/Cold Water	YelBlk/ GrnWht	7203/7055				NPWC
Non-Potable/Hot Water	Yel/Blk	7203/7146				NPWH
Non-Potable/Make-up Water	Yel/Blk Grn/Wht	7203/7182				NPMU
Non-Potable/Hot Water Recirculation	Yel/Blk	7203/7147				NPWHR
Oxygen	Yel/Blk	7209				O2
Potable/Cold Water	Grn/Wht	7217/7055				PWC
Potable/Hot Water (Use Grn/Wht Arrows)	GrnWht/ YelBlk	7217/7146				PWH
Potable/Hot Water Recirculation (Use Grn/Wht Arrows)	GrnWht/ YelBlk	7217/7147				PWHR
Process/Cooling Water Return	Grn/Wht	7224/7071				PCWR
Process/Cooling Water Supply	Grn/Wht	7224/7072				PCWS
Process Liquid Waste- Hazardous	Yel/Blk	Special				PLWH
Process Liquid Waste- Non Hazardous	Grn/Wht	Special				PLWNH
Radioactive Liquid Waste	Yel/Blk	Special				RLW
Radioactive Liquid Waste Vent	Yel/Blk	Special				RLWV
Refrigerant Discharge (Hot Gas)	Yel/Blk	7234				RFND

Pipe Identification	Background Color/ Letter Color	Outside Diameter (Letter Height)				Valve Tag Legend
		6" or greater (3 1/2" high) Style 1HV*	3" to less than 6" (2" high) Style 1*	1" to less than 3" (3/4" high) Style 4*	Less than 1" (5/16" high) Style 3C*	
		Pipe Marker Catalog Numbers				
Refrigerant Liquid	Yel/Blk	7235				RFNL
Refrigerant/Relief	Yel/Blk	7235/7239				RFNR
Refrigerant Suction	Yel/Blk	7236				RFNS
Sanitary Vent	Yel/Blk	7252				SWV
Sanitary Waste	Yel/Blk	7253				SW
Sanitary Wastewater Treated Effluent	Yel/Blk	Special				SWTE
Storm Water	Grn/Wht	7275				STW
Sump Pump Discharge	Yel/Blk	7280				SPD
Tower Water/Drain	Grn/Wht	7285/7090				TWD
Tower Water Return	Grn/Wht	7286				TWR
Tower Water Supply	Grn/Wht	7287				TWS
Vacuum	Yel/Blk	7291				VAC
Vacuum/Pump Discharge	Yel/Blk	7291/7280				VACPD

* Include style number in parenthesis () following the catalog number.

B. AIR DUCT MARKERS

Duct Identification	Background Color/ Letter Color	Catalog Number
Air Return	Blu/Wht	7008
Air Supply	Blu/Wht	7010
HEPA Exhaust Air	Yel/Blk	Special/7098/7005
Lab Exhaust Air	Blu/Wht	Special/7100
Mixed Air	Blu/Blk	Special/7006
Outside Air	Blu/Wht	7206
Perchloric Exhaust Air	Yel/Blk	Special/7098/7005
Relief Air	Blu/Wht	7240
Toilet Exhaust Air	Blu/Wht	Special/7100
Vacuum Exhaust Air	Yel/Blk	7291/7098/7005

C. SAFETY SIGNS

Location	Wording	Size/Catalog Number
Each fixture served by non-potable water	NOTICE Non-Potable Water not to be used for drinking, washing or cooking purposes.	7 X 10/40925
First steam valve inside the building.	CAUTION Only Utilities is authorized to operate this valve. Call 7-4842 to schedule valve operation.	Special order. Yellow background color/black lettering. Size 5 x 10 (min.), aluminum.
Fire Hydrant served by non-potable water	CAUTION Non-Potable Water – Do Not Drink.	7 X 10/40846

END OF SECTION

Do not delete the following reference information:

FOR LANL USE ONLY

This project specification is based on LANL Master Construction Specification Rev. 6, dated October 1, 2003.